UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
THOMAS, MIA M

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/522,467	LESELLIER ET AL.
	Examiner	Art Unit
	Mia M. Thomas	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>23 September 2008</u>.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-9</u> is/are pending in the application.
     4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>1-9</u> is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on <u>23 September 2008</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
     a)☒ All   b)☐ Some *   c)☐ None of:
       1.☐ Certified copies of the priority documents have been received.
       2.☐ Certified copies of the priority documents have been received in Application No. _____.
       3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
     * See the attached detailed Office action for a list of the certified copies not received.

DETAILED ACTION

Response to Arguments

1.   This is Office Action is responsive to applicant's remarks received on 23 September

2008. Claims 1-9 are pending and stand rejected. Claims 1-9 have been amended. Claims 1, 8

and 9 are independent claims.

The Examiner notes that Claim 7 as presented in the listing of claims dated 26 August 2008

(Amendment after Final) includes that Claim 7 is also independent. The entry of this amendment

has been entered and a complete response to the applicant's remarks follows herewith.

Claim Rejections - 35 USC § 101

2.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

Claims 1-6 are rejected under 35 U.S.C. 101 as not falling within one of the four

statutory categories of invention.   While the claims recite a series of steps or acts to be

performed, a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory

category (such as a particular apparatus), or (2) transform underlying subject matter (such as an

article or material) to a different state or thing (Reference the May 15, 2008 memorandum

issued by Deputy Commissioner for Patent Examining Policy, John J. Love, titled "Clarification

of 'Processes' under 35 U.S.C. 101" – publicly available at USPTO.GOV, "memorandum to

examining corp"). The instant claims neither transform underlying subject matter nor positively

tie to another statutory category that accomplishes the claimed method steps, and therefore do

not qualify as a statutory process.   In order for a process to be "tied" to another statutory

category, the structure of another statutory category should be positively recited in a step or

steps significant to the basic inventive concept, and NOT just in association with statements of

intended use or purpose, insignificant pre or post solution activity, or implicitly.

****<u>**Note:**</u> This suggestion below would be an adequate "tie" to a "processor" or "computer". It is
suggested that the applicant and/or applicant's representatives make sure any suggestions or
claim amendments are indeed SUPPORTED by the specification and 35 U.S.C. 112
requirements.

1. (Currently amended) A method of processing a sequence of digital images, intended to detect

a grid corresponding to blocking artifacts <u>within said digital images</u> **<u>using a processor (or</u>**

<u>computer) to perform the steps of:</u>

detecting (100) a spatial grid (SG) within a portion of the image,

determining (200) a current reference grid (RG(t)) from a current spatial grid (SG(t)) and a

preceding reference grid (RG(t-1)), based on a row comparison between said current reference

grid and said preceding reference grid, wherein a number of grid rows differing between the

current spatial grid SG(t) and the preceding reference grid RG(t-1) is smaller than one third a

number of grid rows of the preceding reference grid RG(t- I);

-<u>correcting blocking artifacts based on artifacts within said current spatial grid</u>

<u>SG.(t) and artifacts within said preceding reference grid RG(t-I);</u>

- <u>assigning said corrected blocking artifacts to said current reference grid RG(t); and outputting</u>

<u>said reference grid RG(t).</u>

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject
Matter Eligibility" (<u>Official Gazette notice of 22 November 2005</u>), Annex IV, reads as follows (see
also MPEP 2106):

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional
> descriptive material." In this context, "functional descriptive material" consists of data structures and
> computer programs which impart functionality when employed as a computer component. (The

definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

3.	Claim 9 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 9 defines a computer program product embodying functional descriptive material (i.e., a computer program or computer executable code). However, the claim does not define a "computer-readable medium or computer-readable memory" and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). The scope of the presently claimed invention encompasses products that are not necessarily computer readable, and thus NOT able to impart any functionality of the recited program. The examiner suggests amending the claim(s) to embody the program on "computer-readable medium" or equivalent; assuming the specification does NOT define the computer readable medium as a "signal", "carrier wave", or "transmission medium" which are deemed non-statutory (refer to "note" below). Any amendment to the claim should be commensurate with its corresponding disclosure.

Note:

"A transitory, propagating signal ... is not a "process, machine, manufacture, or composition of matter." Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter." (In re Nuijten, 84 USPQ2d 1495 (Fed. Cir. 2007). Should the full scope of the claim as properly read in light of the disclosure encompass non-statutory subject matter such as a "signal", the claim as a whole would be non-statutory. Should the applicant's specification define or exemplify the computer readable medium or memory (or whatever language applicant chooses to recite a computer readable medium equivalent) as statutory tangible products such as a hard drive, ROM, RAM, etc, **as well as** a non-statutory entity such as a "signal", "carrier wave", or "transmission medium", the examiner suggests amending the claim to *include* the disclosed tangible computer readable storage media, while at the same time *excluding* the intangible transitory media such as signals, carrier waves, etc.

Merely reciting functional descriptive material as residing on a "tangible" or other medium is not sufficient. If the scope of the claimed medium covers media other than "computer readable" media (e.g., "a tangible media", a "machine-readable media", etc.), the claim remains non-statutory. The full scope of the claimed media (regardless of what words applicant chooses) should not fall outside that of a computer readable medium.

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5.   Claims 1, 2 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to Claim 2, the claim has a limitation (SG, RG) at line 2 of the claim. It is unclear to the Examiner what "(RG)" is referring to in the claim. It appears that when read in light of the specification that "(RG)" is possibly referring to a reference grid but the Examiner is uncertain if the applicant is pointing to "a current reference grid" (RG(t)) or a preceding reference grid (RG(t-1). It is important that the applicant clarify which reference grid (RG) is referring to or delete the limitation from the claim.

6.   Claim 1 recites the limitation " within said digital images " at line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim. It appears that when read in light of the specification that " within said digital images " is in fact referring to "a sequence of digital images" first introduced at line 1 of claim 1 and this will be assumed for examination purposes.

Similar claim analysis and rejection apply for claim 8 with regards to the limitation " within said digital images " at line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Also at claim 1, line 14, "said reference grid RG(t)" has insufficient antecedent basis. It appears that when read in light of the specification that "said reference grid RG(t)" is in fact referring to "a current reference grid RG(t)" first introduced at line 5 of Claim 1 and this will be assumed for examination purposes. Similar claim analysis applies to claim 2, at line 3.

7.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8.   Claims 5 and 6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With regards to Claim 5 and 6, the "current reference grid (RG(t))" is not in the "correcting the blocking artifacts step, the "current reference grid (RG(t)) is introduced in the processing of assigning the corrected blocking artifacts. Examiner notes that it is important that the applicant and/or applicant's representative identify where these claimed limitations are supported by the original specification of this instant application for proper claim interpretation and analysis.

Specification

9.   Claim 5 is objected to because of the following informalities: "preformed" at line 3 of the claim appears to be a typographical error. It is believed that "preformed" should be edited to "performed" as similarly recited at claim 6, line 3. Appropriate correction is required.

Response to Arguments

10.   Applicant's arguments, see page 7, with respect to Claim 7 (rejection under 35 USC 112, first paragraph for not providing enablement with regards to a single element performing all of the claimed functions) have been fully considered and are persuasive.

Examiner's Response: The rejection of claim 7 under 35 USC 112, first paragraph has been withdrawn.

11.   Applicant's arguments, see page 7 (last two paragraphs), with respect to Claim 1 and 8

(rejection under 35 USC 112, second paragraph for failing to distinctly claim the subject matter

which the applicant regards as his invention) have been fully considered and are persuasive.

Claims 1 and 8 have been amended to further recite the elements of the correction of the

artifacts within a present frame based in part on a previous frame and the outputting of the

current frame containing the corrected blocks.

Examiner's Response: The rejection of claim 1 and 8 under 35 USC 112, second paragraph has

been withdrawn.

12.   Applicant's arguments at page 8 with respect to "Drawing Objections" have been fully

considered but they are not persuasive.

The applicant states that a replacement sheet has been submitted that now shows the

designation of the p1 type rows with the numeral 1. It is unclear to the Examiner what means

the applicant is using to convey these changes; however the objection to the Figures is

maintained. The Examiner is still unable to read the graphs at Figures 3a and 3b. The drawings

still fail to show appropriate contrast and distinct details. The applicant is encouraged to submit

the drawings in another format so as to conform with the drawing requirements stated by the

Examiner. The objection to the drawings stands.

13.   Applicant's arguments, see page 8, with respect to Claim 1 and 8 (rejection under 35

USC 112, second paragraph) have been fully considered and are persuasive. Applicant has

submitted that the processing of the artifacts contained within the digital image encompasses

processing the digital images as is now referred to in the preamble. The rejection of claims 1

and 8 under 35 USC 112, second paragraph has been withdrawn.

14.   Applicant's arguments, see page 9, with respect to 35 USC 101 rejections have been

fully considered and are persuasive. Applicant submits that the amended claims 1, 8 and 9

further recite that the artifacts are corrected and outputted. Support for the amendment may be

found at least on page 11, lines 25-30.

Examiner's Response: The rejection of claims 1, 8 and 9 has been withdrawn.

15.   Applicant's arguments at page 9, with respect to the 35 USC 101 rejections have been

fully considered but they are not persuasive. At page 11, lines 25-30 of the instant application

recite "the computer program may also be loaded into the programming memory for reading a

data carrier such as, for example, a disc comprising said program. The reading operation may

also be performed by means of a communication network such as, for example, the Internet. In

this case, a service provider will put the computer program in the form of a downloadable signal

at the disposal of those interested. The recitation of the claim does not state that the computer

program product resides on a computer readable medium. The claim states that the computer

program product resides on a programming memory. The claims are read in light of the

specification, however, the circuit as recited in the instant application defines the transmission of

the computer program product can be in the form of a downloadable signal which is also non-

statutory. Therefore, Claim 9 has been rejected under 35 USC 101.

Claim Rejections - 35 USC § 103

16.   The text of those sections of Title 35, U.S. Code not included in this action can be found

in a prior Office action.

17.   Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Martins et al. (US

6,438,275 B1) in combination with Kryukov et al. (US 7003174 B2)

Regarding Claim 8: (Currently amended) Martins teaches a device for processing a sequence

of digital images, intended to detect a grid corresponding to blocking artifacts <u>within said digital</u>

<u>images</u> (Refer to Figure 1; "An embodiment of the present invention comprises a method and

apparatus for performing motion compensated, pixel-based interpolation of frames in a digital

video stream." at column 2, line 53; "Embodiments of the present invention may reduce

noticeable block artifacts produced by known prior art FRU implementations, reduce the number

of interpolated frames considered "visually unacceptable" that are dropped by known prior art

FRU implementations, and enable more consistent operation for highly dynamic content..." at

column 3, line 14) said device comprising:

-means for determining a current reference grid (RG(t)) (Refer to Figure 2, numeral 22) from a

current spatial grid (SG(t)) (Refer to figure 2, numeral 20) and a preceding reference grid (RG(t-

1)) (Refer Figure 2, numeral 24).

Martins expressly teaches <u>means for outputting said corrected blocking artifacts</u> (Refer to

Figure 7, numeral 416, via numeral 402)

Kryukov teaches means for detecting a spatial grid (SG) within a portion of the image (Refer to

Figure 2; "The practice of this invention operates on digital images. A digital image comprises a

collection of picture elements or pixels arranged on a regular grid." at column 6, line 4),

Kryukov also teaches based on a row comparison (Refer to Figure 1, numeral P0, P1, P2 and

P3)

a number of grid rows differing between the current spatial grid SG(t) and the preceding

reference grid RG(t-1) is smaller than one third a number of grid rows of the preceding

reference grid RG(t-1) (Refer to column 10, lines 61-column 11, line 44)

Kryukov teaches <u>means for correcting the blocking artifacts which are present in the current</u>

<u>reference grid RG(t)) in accordance with a value of the indicator (ind)associated with each of</u>

<u>said sets</u> ("A method of reducing artifacts in an image previously processed by block transform

encoding according to the invention may comprise the steps of: determining block boundaries;

determining an approximate metric of artifact visibility; optionally interpolating across block

boundaries; adaptively filtering luminance; optionally adaptively filtering chrominance; adaptively

adjusting local saturation variation; and adaptively simulating high spatial frequency image

detail; wherein the adaptive steps are executed to an extent or in an amount depending on the

said metric or standard or measurement of artifact visibility." at column 5, line 45);

Martins does not specifically teach a row comparison , however Martins does expressly teach a

current reference grid (Refer to Figure 2, numeral 22) and a preceding reference grid (Refer

Figure 2, numeral 24).

Since all of the claimed elements were known in the prior art at the time of the invention, one skilled in the art could have combined the teachings of Martins and Kryukov by known methods to detect these blocking artifacts based on a row comparison and analyze these elements to further execute correction means. The combination of the teachings of Martins and Kryukov would have presented no change in the respective functions of these teachings and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Martins and Kryukov are combinable because they are in the same field of image transformation and enhancement.

At the time that the invention was made, it would have been obvious to the skilled artisan to combine the teachings of Martins and Kryukov.

The suggestion/motivation to do so would have been to "reduce artifacts in an image previously processed by block transform encoding. It would have also been obvious to combine the teachings of Martins and Kryukov to determine block boundaries; determine an approximate metric of artifact visibility; optionally interpolating across block boundaries; adaptively filter luminance; optionally adaptively filter chrominance; adaptively adjusting local saturation variation; and adaptively simulate high spatial frequency image detail; wherein the adaptive steps are executed to an extent or in an amount depending on the metric or standard or measurement of artifact visibility." (abstract, Kryukov).

Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings

of Martins and Kryukov to obtain the specified claimed elements of Claim 8.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Mia M. Thomas whose telephone number is (571)270-1583.   The

examiner can normally be reached on Monday-Thursday 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Vikkram Bali can be reached on 571-272-7415.   The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system.   Status information for published applications

may be obtained from either Private PAIR or Public PAIR.   Status information for unpublished

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would like assistance from a USPTO Customer Service Representative or access to the

automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mia M Thomas/
Examiner, Art Unit 2624

/Brian P. Werner/
Supervisory Patent Examiner, Art Unit 2624